

**Unit -2 Functions**

- 58 When do you say a function is one to one? ( 2 times) 02 D15
- 59 If  $f(x) = \frac{1}{x}, x \in Z - \{-1, 0, 1\}$  the prove that  $f(x+1) - f(x-1) = \frac{2}{1-x^2}$  (4 times) 05 D15
- 60 It is observed that a quadratic function  $y = ax^2 + bx + c$  fits the points (-1, 8), (1, 4), (2, 5). Find the constants a, b, c and rewrite the function, also find value of y when x=4 05 D15
- 61 If  $f(x) = x^3 - 2x + \frac{1}{x}$  then find  $f(x) + f(-x)$  ( 2 times) 05 D15
- 62 If  $f(x) = x^2 + 4x + 5$  and  $g(x) = 2x + 1$  then prove that  $f(1) - 2g(2) = 0$  05 D15
- 63 The fixed cost of Transistors is Rs. 2,00,000 and variable cost is Rs. 1,000 per unit. If selling price is 1,500 Rs., then find 05 D15
- i) Cost function
- ii) Revenue Function
- iii) Breakeven point
- 64 If  $f(x) = 2x^2 - 1$  and  $g(x) = 2x - 1, x \in \{0, 1, 2\}$  are function equal?(4 times) 05 D15
- 65 Define one-one function with illustration 02 M15
- 66 Find  $f(-1) + f(2)$  for  $f(x) = x^2 - x + 1$  02 M15
- 67 Define Range of the function and find  $R_f$  for  $f(x) = x^3 - x + 2, D_f = \{-1, 0, 1\}$  (2 times) 02 M15
- 68 If  $f(x) = \frac{x(x-2)}{x-1}$  then find  $f(0)+f(-1)+f(3)+f(2)$  (2 times) 05 M15
- 69 The supply function of a commodity is  $S = 7p - 2$  then find 05 M15
- i) Supply when price P=250 Rs.
- ii) At what price, the supply becomes 3540 units? ( 2 times)
- 70 If  $f(x) = x^3 - 2x + \frac{1}{x}$  then find  $f(x) - f(-x)$  05 M15
- 71 It is observed that a quadratic function fits the data points (1, 9), (2, 14), (3, 23). Find the function and estimate y when x=4 (2 times) 05 M15
- 72 Fixed cost of a factory producing particular types of bag is Rs. 9000 and the variable cost per bag is Rs. 110. If selling price per bag is Rs. 240 then find profit function. 05 M15
- 73 Find  $f(0) + f(1)$  for  $f(x) = x^2 - x + 1$  02 D14
- 74 Define breakeven point ( 2 times) 02 D14
- 75 Examine whether following function are equal or not 05 D14
- $f(x) = \frac{x^2 - 9x + 14}{x - 2}, x \in Z - \{2\}$  and  $g(x) = x - 7; x \in Z - \{2\}$
- 76 The total cost and total revenue function are given as  $C(x) = 5x + 350$  and  $R(x) = 50x - x^2$  then find profit for x=10. 05 D14
- 77 When do you say that two functions are equal? 02 M14
- 78 If  $f(x) = 2x^2 - 2x + 3$  then find  $f(1) \cdot f(3) - f(0) \cdot f(-2)$  05 M14
- 79 If the cost function of a monopolist is  $C(x) = 5x + 9$  then find 05 M14
- i) Cost when 26 units are produced
- ii) How many units can be produced from Rs. 219?
- 80 If  $f(x) = (1 - x^2) - x$  then find  $\frac{f(1)+f(-1)}{f(-2)}$  05 M14
- 81 The cost function of a commodity is  $C(x) = 28x + 215$  and the selling price per 05 M14

- unit is Rs. 33 then find Breakeven point
- 82 If  $f(x) = x^2(x - 1)^2$ ,  $x \in R$  then prove that  $f(x + 1) - f(x) = 4x^3$  05 M14
- 83 Define one-one function and many-one function with illustration(2 times) 02 D13
- 84 If  $f(x) = x^2 + x - 1$  then find value of  $f(x + 1) - 3f(x - 1) + 2f(x)$  05 D13
- 85 If  $f(x) = \frac{1}{x} + \frac{2}{x-3}$ ;  $x \in R - \{0,3\}$  then find  $f(1), f(2), f(1/3)$  and  $f(-3)$  05 D13
- (2 times)
- 86 If the demand function is  $x = \frac{50-2p}{3}$  then find the revenue function. Also find the no. of write for breakeven point. ( 2 times) 05 D13
- 87 Define domain and range of a function. If domain of  $f(x) = \sqrt{x^2 + 3}$  is  $\{1,2,3,4\}$  then find range of  $f$ . 05 M12
- 88 If  $f(x) = \frac{x^2-x}{x+3}$  then find  $\frac{f(0)+f(-2)}{f(1)+f(3)}$  (2 times) 05 D13
- 89 If  $f(x) = x(x + 1)(2x + 1)$  then prove that  $f(x) - f(x - 1) = 6x^2$  05 D13
- 90 Define cost function with illustration 01 M13
- 91 Define supply function with illustration 01 M13
- 92 The supply function of a commodity is  $S = ap^2 + bp + c$   $(P, S) = (2,12), (3,38), (4,74)$ . Find the constants a, b, c to determine exact supply function and find it when  $P=5$ . Also find the price when supply is 120 units. 05 M13
- 93 State the type of the following functions: 05 M13
- $f: N \rightarrow N, f(x) = 7$
  - $f: Z \rightarrow Z; f(x) = x^2 + 6$
  - $f_2: R \rightarrow R; f_2(x) = x^2 + 2x + 1$
- 94 If  $f(x) = \log\left(\frac{1+x}{1-x}\right)$  then prove that  $f(x) = \frac{1}{2}f\left(\frac{2x}{1+x^2}\right)$  05 M13
- 95 The production cost of each book is Rs. 30 and the fixed cost is Rs. 15,000. If the selling price is Rs. 45 then find 05 M13
- Cost function
  - Revenue function
  - Breakeven point
- 96 Define onto function 01 D12
- 97 Define demand function 01 D12
- 98 Define function. Examine whether the following functions are equal? 05 D12
- $f: R^+ \rightarrow R^+; f(x) = \sqrt{x^2}$  and  $g: R^+ \rightarrow R^+; g(x) = |x|$
- 99 A function is defined as 05 D12
- $f(x) = 2x + 3; x \in [-2,0]$   
 $= 4 - 3x; x \in (0, \infty)$
- Then obtain the value of  $\frac{f(-2)-f(-1)}{f(2)+f(1)}$  (2 times)
- 100 If  $f(x) = x^3$  and  $g(x) = 3x^2 - 2x$  where  $D_f = D_g = \{0,1,2\}$ . If  $f=g$ ? Justify your answer. 05 D12
- 101 If  $f(x) = x^2 + x - 1$  then prove that  $f(x + 1) - 3f(x) + 2f(x - 1) = 2 - 2x$  05 D12
- 102 The cost function of an item is  $C(x) = 4x + 770$  and the selling price per unit is Rs. 15 then finds Breakeven point. If the profit is Rs. 1100 then find the number of units to be produced.( 2 times) 05 D12

## 102 : Mathematics

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|-----|--|----|-----|
| 103 | If $f(x) = x^2 - 1$ then find $f(x + 1)$   | 01 | M12 |
| 104 | The cost of manufacturing 50 pens is Rs. 15,000 and that of manufacturing 300 pens is Rs. 40,000. If the relationship between the number of units produced and its cost is linear, then find the relation. Also find the cost of manufacturing 400 pens. | 05 | M12 |
| 105 | If $f(x) = \frac{x^2-25}{x-5}; x \in Z - \{5\}$ and $g(x) = x + 5; x \in Z$ . Is $f(x) = g(x)$ ?   | 05 | M12 |
| 106 | If $f(x) = \frac{x^2-5x+7}{x^2+2}; x \in Z$ then find $\frac{f(1)+f(-2)}{f(-1)+f(0)}$  | 05 | M12 |
| 107 | If $y = f(x) = \frac{ax+b}{cx-a}$ then prove that $x = f(y)$   | 05 | M12 |
| 108 | If $f(x) = 5x + 2$ where $x \in R$ then find domain of $f$   | 02 | D11 |
| 109 | If $f(x) = \frac{x+1}{x^2-x+1}$ ; then find $f(2) + f(3)$  | 05 | D11 |
| 110 | The demand function of computer is $d = f(p) = \sqrt{4850 - 5p}$ . If the price of computer is Rs. 250. Then find the demand. At what price of computer demand will be zero.   | 05 | D11 |
| 111 | Define domain and range of a function. If $f: N \rightarrow N, f(x) = 3x - 2$ and range of a function is $\{1, 4, 7\}$ then find domain of $f$ .   | 05 | D11 |
| 112 | If $f(x) = \frac{x^2-1}{x+5}$ ; then find $\frac{f(0)+f(1)}{f(2)+f(3)}$  | 05 | D11 |
| 113 | It is observed that a quadratic function $y = ax^2 + bx + c$ fits the data points $(-1, 8), (1, 4), (2, 5)$ then find that function and estimate it when $x=2$   | 05 | D11 |
| 114 | If $f(x) = 3x^2 + mx + 5$ and $f(2) = 27$ then find the value of $m$   | 02 | M11 |
| 115 | 'Every function is a relation' or 'Every relation is a function' Which is true? Justify your answer.   | 02 | M11 |
| 116 | $f = \{(1,1), (2,3), (3,5), (4,7)\}, A = \{1,2,3,4\}, B = 2$ . If $f: A \rightarrow B$ is a function such that $f(x) = ax + b$ then find $a$ and $b$   | 05 | M11 |
| 117 | If $f(x) = x^2 - x + 1$ then find value of $f(x + 1) - 3f(x - 1) + 2f(x)$ .  | 05 | M11 |

Remarks:-